

\$1.50 each

J. B. Meek

MEMOIRS  
OF THE  
GEOLOGICAL SURVEY  
OF  
THE UNITED KINGDOM.

~~~~~  
*Figures and Descriptions*

ILLUSTRATIVE OF  
BRITISH ORGANIC REMAINS.

—  
DECADE IV.  
~~~~~

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF HER MAJESTY'S TREASURY.

LONDON:  
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE:  
PUBLISHED BY  
LONGMAN, BROWN, GREEN, AND LONGMANS.  
1852.

## BRITISH FOSSILS.

---

### DECADE THE FOURTH.

ALL the plates and descriptions in this Decade are devoted to fossil Echinodermata of the order *Echinoidea*.

The genera selected for illustration are *Temnechinus*, *Acrosalenia*, *Hyboclypus*, *Hemipneustes*, *Ananchytes* with its section *Holaster*, and *Cardiaster*. The geological age of the first is Upper Tertiary, of the second and third Oolitic, of the remainder Cretaceous. Several of the species are represented for the first time.

*Temnechinus* is a genus remarkable for its species being at present known only as fossils of the Coralline and Red Crag; it is now characterized for the first time.

The examples of *Acrosalenia* selected are both remarkable for their beauty and their very perfect condition. They are also of much interest, one on account of the rectification of its true generic position, which I have been enabled to make through the aid afforded by very perfect specimens: the other, because of the complete preservation exhibited by the specimens described of parts too often lost in fossil Echinoderms. I have appended to the descriptions of these *Acrosalenia* brief characters of some new species of this interesting oolitic genus.

*Hyboclypus* is illustrated by the finest and largest species of the genus, one discovered during the researches of the Geological Surveyors.

*Hemipneustes*, to which genus I unite *Toxaster*, is now for the first time authentically represented by a British example, remarkable for its novelty and for the light it throws upon the mutual affinities of those genera of *Echinoidea* which have excentric mouths.

The well known genus *Ananchytes* is combined (as indeed it was formerly by Lamarek) with *Holaster*. In selecting the common *Ananchytes ovata* of the Chalk for the subject of a plate and description, I have been influenced by the necessity of clearing up the confused synonymy of this fine fossil, and of settling the numerous spurious species which have been constituted out of its varieties, or from imperfect figures contained in old works.

*Cardiaster* is a new genus, lately constituted by myself for some remarkable and interesting sea-urchins, intermediate in their characters between *Ananchytes* and the true *Spatangida*. To the account of the species figured I have added notices of all the forms of this curious type which are known to me as British.

EDWARD FORBES.

October, 1852.

---

# BRITISH FOSSILS.

---

## DECADE IV. PLATE IV.

---

### HYBOCLYPUS AGARICIFORMIS.

[Genus HYBOCLYPUS. AGASSIZ. (Sub-kingdom Radiata. Class Echinodermata. Order Echinoidea. Family Cassidulidæ.) Body ovate or suborbicular, more or less expanded and depressed. Ambulacra homogeneous, subsimilar, the three anterior ones converging and separated from the two posterior. Posterior interambulacral segments with a deep longitudinal dorsal groove, in the upper extremity of which the vent is lodged. Mouth central, inferior. Tubercles minute, perforated, and placed on crenulated bossés.]

REFERENCE. *Hyboclypus agariciformis*, FORBES,—WRIGHT in Annals and Mag. Nat. Hist. 2d series, Vol. ix. p. 99. (1851.)

DIAGNOSIS. *H. testâ suborbiculari depressâ sinuosâ postice subtruncatâ ambulacris omnibus superne approximatis.*

This fine species, the largest of its genus with which I am acquainted, is of a suborbicular or obscurely pentagonal shape, expanded, depressed above, (except when young and then it is gently convex,) somewhat sinuate, rather acutely margined, and strikingly mushroom-like in general aspect. Beneath, it is plain and slightly sinuous. Usually its breadth slightly exceeds its height, and in old specimens the vertex is often depressed. Its ambulacra, and also its interambulacra, are remarkably unequal. The anterior or odd ambulacrum is in its widest dorsal portion rather less than one fourth of the diameter of the contiguous part of the antero-lateral interambulacra. The antero-lateral ambulacra are slightly broader than the odd one, and narrower than the two postero-laterals. The three anterior ambulacra converge around the fore portion of the deeply excavated and pit-like apical disk. Their terminations just impinge upon it, whereas those of the posterior ambulacra which are sinuous and unsymmetrical, plunge into it; they are unsymmetrical chiefly in consequence of the sudden inward turn made by the uppermost portions of their avenue border on the anal side. The antero-lateral interambulacral segments of the back are one fourth less in width than the laterals; and these are broader at their marginal portions than the posterior interambulacral



segment, the margin of which is slightly truncate. The dorsal surfaces of the anterior and lateral interambulacral, and of all the ambulacral segments, are convex with a gentle curve, but that of the hinder interambulacral segment is excavated by a deep longitudinal furrow opening into the nearly round apical pit, narrow and steep sided in its upper half, depressed and expanding in its lower portion, where the sides of the segment are also flattened, and more or less declining. The margin of the apical pit is notched with four strongly marked interambulacral notches and five less strongly marked ambulacral ones, the former correspond to the insertions of the four perforated genital plates, and the latter to those of the five ocular ones; but no specimen has yet occurred exhibiting the minute details of the disk. The whole of the plates of the dorsal surface bear very numerous minute, regular, and nearly equal primary tubercles, perforated, borne on crenulated bosses and lodged in a depression forming an areola about each; they are separated from each other by granules. These tubercles become still more numerous and slightly larger on the marginal portions of the test, where they are separated from each other by so narrow a line of granules that each appears to be placed within an hexagonal frame. Towards the mouth they gradually increase in size and become more separated, with considerable numbers of granules keeping them apart. The pairs of pores are ranged in the avenues dorsally in single file, but when they turn the margin and pass on to the under surface they first gradually fall into oblique sets of three pairs, and eventually, close to the mouth, into very oblique ranks of threes. The mouth is excentric in the opposite direction from the apical disk, for whereas the latter is excentric towards the postcal extremity, the mouth is excentric towards the antecal margin. The mouth is longer than it is wide, and has rounded slightly tumid lips; the spines are minute and very short, subulate and finely striated.

Dr. Wright has met with a specimen three inches and  $\frac{1}{10}$ ths in diameter. A fine example in the Museum of Practical Geology measures 2 inches and  $\frac{7}{8}$ ths in length by 2 inches  $\frac{9}{16}$ ths in breadth. The greatest thickness is  $\frac{1}{4}$ ths of an inch. From vertex to posterior margin it measures 1 inch and  $\frac{3}{8}$ ths, and to the anterior margin 1 inch and  $\frac{1}{4}$ ths; the anterior and antero-lateral ambulacra are  $\frac{3}{16}$ ths of an inch in breadth; the postero-laterals  $\frac{1}{10}$ ths of an inch in breadth. The length of the mouth is  $\frac{3}{10}$ ths, and its breadth  $\frac{1}{10}$ ths of an inch. The breadth of the anal furrow just below the apical concavity is  $\frac{1}{4}$ ths of an inch.

A young specimen exhibits different proportions; it is one inch and  $\frac{7}{8}$ ths in length, by 1 inch and  $\frac{8}{12}$ ths in breadth. Its height is three fourths of an inch.

*Locality and Geological Position.* The specimens in the collections made by the Geological Survey are all from the Inferior Oolite. They are from the pea-grit of Crickley Hill in Gloucestershire, where they occur in company with the rarer *Hyboclypus caudatus*; from between Wayford and Seaborough in Dorsetshire, where they are accompanied by *Dysaster ringens* and *Galerites* (*Holcotypus*) *hemisphericus*; and at Camlong Down near Uley Bury.

*Hyboclypus gibberulus* has been met with during the progress of the survey near Bridport, and in two other localities in Dorsetshire.

In figuring this species we are much indebted to Dr. Wright for his kindness in permitting us to make use of some fine examples in his possession.

---

#### EXPLANATION OF PLATE IV.

Fig. 1. A large specimen of *Hyboclypus agariciformis* seen from above.

Fig. 2. The under side of a smaller example.

Fig. 3. Terminal view.

Figs. 4. and 5. Outlines of a less expanded specimen.

Figs. 6. and 7. A young specimen, much more convex.

Fig. 8. Dorsal ambulacral and interambulacral plates.

Fig. 9. Ambulacral and interambulacral plates of under surface.

Fig. 10. Arrangements of the apex and anal groove.

Figs. 11. and 12. Tubercles and granules.

EDWARD FORBES.

October, 1852.

